

Tabber-Stringer ZET2010

... for cells down to 120 microns



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PLC/PC controlled

The Tabber-Stringer assembles cells of up to 8".

The well-tested infrared-soldering-process guarantees best precision soldering of solar cells within a stable and closely monitored process window. Cells are handled with sensitive care and through profiled temperature curves and time curves, stress is reduced to a minimum.

The solder control unit determines and monitors all processes. All data are displayed and automatically logged in an internal data base to be used e.g. for statistics and quality purposes.

Specification datas

String Characteristics

- cell per string
 - up to 12 pieces at a 6" cell size; endless is option
- gap between cells
 - range: 1.5 to 50 mm (0.06" to 1.9")
 - typical: 1.8 mm (0.07")
- string length
 - standard 2 meters, endless possible as option
 - 7 magazines is standard

Option

- vision control after soldering
- vision control in lay-up
- additional more magazines

To be defined

- tabbing material for cell connection
- solder and flux

Solar Cell Characteristics

- cell dimension square or semi square (up to 210 x 210 mm, +/- 0.5 mm)
- cell thickness (max. 300 µm; min. 120µm)
- metal alignment to cell variation (+/- 120 µm)
- flatness (+/- 1mm)
- material (poly or mono-crystalline silicon)
- type of contact (front connecting)
- ribbons; typical 25 µm
- 2 or 3 busbars possible (option)

So we can solder down to 120 micron thickness

Infrared soldering

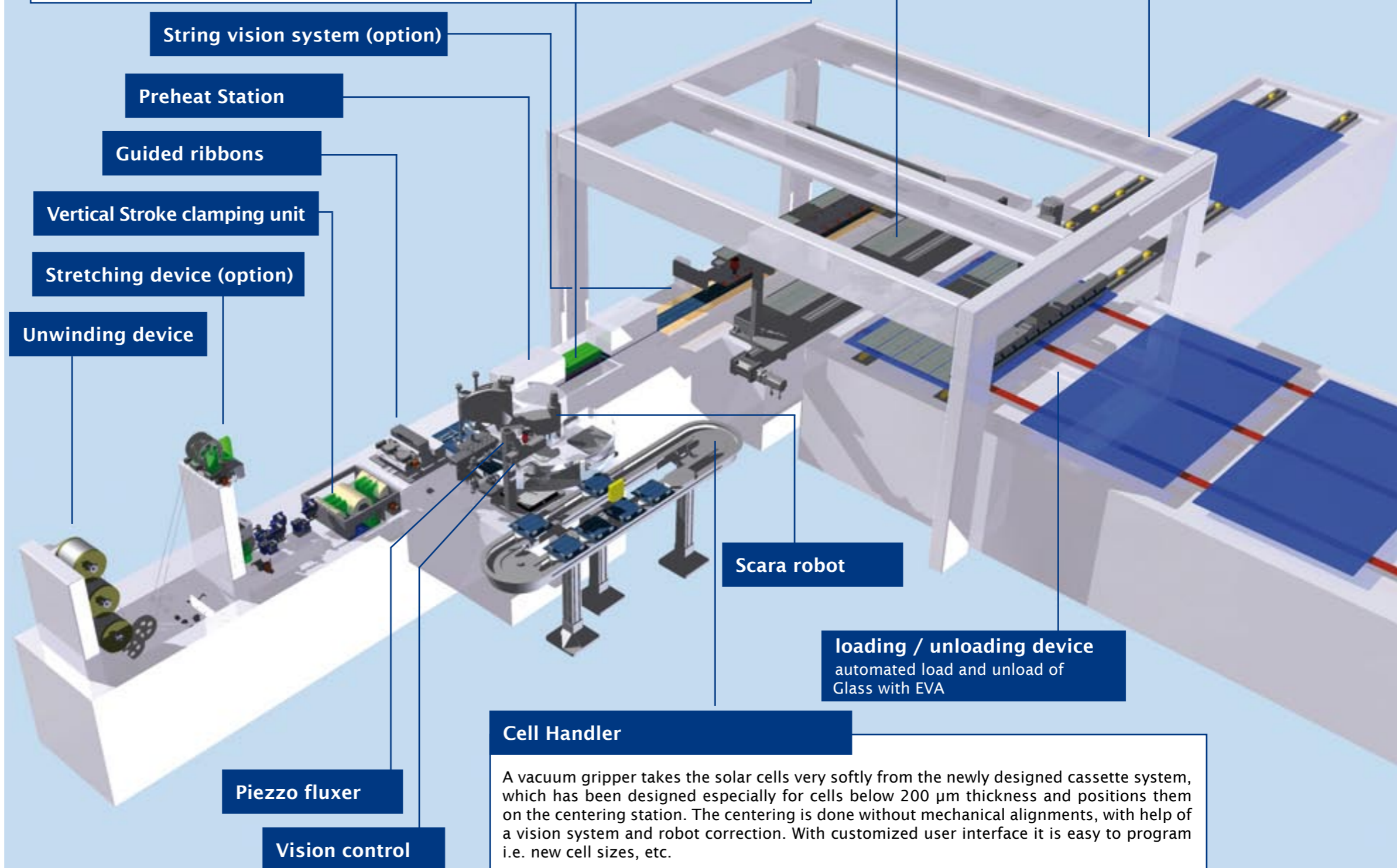
This tested infrared soldering process from top and bottom guarantees best results and less broken cells. The process is very broad and stable. Also all parameters are stored in our internal data base.

Temperature is controlled with the control unit/PC very accurately, reducing the cell stress to an absolute minimum. While the cells are heated up with a controlled profile, soldering temperature is transferred to the cell only the solder points achieving reliable solder joints. The integrated base heating of the cells makes the process much more stable, because we only need a solder peak at the solder points. Special lamps enable a stress free soldering (patent is pending).

Controlled heating cooling (with pre-heated lamps) after the soldering makes sure that the soldered ribbons do not shrink too fast and do not stress the cells too much.

So we even can solder very thin cells. With the special ribbon solder treatment, the stress is reduced to an absolute minimum with our patented solder solution.

Another patent for the stress free soldering is pending. This method was developed with ATN, Dr. Niemeier, a well known solder specialist. Our stringer implements these patented solutions.



String vision system (option)

Preheat Station

Guided ribbons

Vertical Stroke clamping unit

Stretching device (option)

Unwinding device

Piezzo fluxer

Vision control

Scara robot

loading / unloading device
automated load and unload of
Glass with EVA

Inline flash station
with centre feature (option)

Lay-up System (option)

Cell Handler

A vacuum gripper takes the solar cells very softly from the newly designed cassette system, which has been designed especially for cells below 200 µm thickness and positions them on the centering station. The centering is done without mechanical alignments, with help of a vision system and robot correction. With customized user interface it is easy to program i.e. new cell sizes, etc.

System-Configuration

- separate cell loading station for continuous loading of cells out of seven stack magazines
- centering station and loading onto 1 or 2 tracks.
- preparing, crimping, holding and correction of the soldering ribbons, with all holders and flux facilities
- special ribbon treatment for extra thin cells
- 2 or 3 busbars (3 busbar = option)
- infrared soldering heads, vision after soldering = option
- control of
 - soldering temperature and time profile
 - pressure and time for clamping unit
 - cooling temperature and time profile
- cell transport in 1 or 2 lines, onto special conveyor belts with vacuum, with continuous and controlled pre-heating
- string indexing on 1 or 2 tracks
- direct lay-up = option
- standard = Boxes for the strings
- with PLC and PC, integrated controls with touch panels, with latest software
- fault diagnosis via modem and via internet
- system built to international safety regulations and CE
- prepared for up to 8" cells
- up to 3 busbars per cell
- technical supplied in hard & soft copy
- documentation in English and German

Options

- lay-up
- third ribbon
- Stretching device
- execute load facility (up to 1500 cells)
- 180 degree turn unit
- bend between cells
- string vision system
- robot lay-up (Kuka)
- robot busing (Kuka)
- six pieces of fluxer (Piezzo)
- inline flash feature
- string centering
- double stringer extension

Sales & Marketing



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Tabber-Stringer ZET 2010 - EN - 03.09 | skugler